Stoller
Hanford Office

HGLP-LDR-047

299-W26-51 (A8061)
Log Data Report

Borehole Information:

Borehole:	299-W26-51 (A8061)		Site:	216-S-6 Crib	
Coordinates (WA St Plane)		GWL[1] (ft):	None	GWL Date:	11/08/06
North (m)	East (m)	Drill Date	Elevation (TOC)	Total Depth (ft)	Type
133589.584	566214.265	04/83	656.85 ft	106	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	1.3	8 5/8	8	5/16	1.3	106

Borehole Notes:

Casing diameter and stickup measurements were acquired using a caliper and steel tape. Measurements are rounded to the nearest 1/16 inch. Logging data acquisition is referenced to the top of casing (TOC).

A 5 ft grout plug was placed inside the casing at the bottom of the borehole at the time of drilling. In addition, grout was placed around the casing from the ground surface to approximately 20 ft. At the time of drilling, contamination was reported in the top 10 ft of the borehole to approximately 80 ft.

In 1990, the borehole casing was extended as part of a crib stabilization effort. It is not known if the reported elevation has been adjusted for this extension.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34TP40587A
Effective Calibration Date:	05/02/06	Calibration Reference:	DOE/EM-GJ1200-2006	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

High Rate Logging System (HRLS) Equipment Information:

Logging System:	Gamma 1C		Type:	HRLS SN: 39-A314
Effective Calibration Date:	11/22/06	Calibration Reference:	HGLP-CC-004	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 2M		Type:	SN: H340207279
Effective Calibration Date:	08/02/06	Calibration Reference:	DOE/EM-GJ1283-2006	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	11/14/06	11/14/06			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	2.0	50.0			
Finish Depth (ft)	106.0	61.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A			
Pre-Verification	AE205CAB	AE205CAB			
Start File	AE205000	AE205105			
Finish File	AE205104	AE205116			
Post-Verification	AE205CAA	AE205CAA			
Depth Return Error (in.)	N/A	- 2			
Comments	No fine-gain adjustment	No fine-gain adjustment			

High Rate Logging System (HRLS) Log Run Information:

Log Run	4	5	6 Repeat		
Date	11/15/06	11/15/06	11/15/06		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	12.0	43.0	15.0		
Finish Depth (ft)	26.0	49.0	18.0		
Count Time (sec)	300	300	300		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	0.5		
ft/min	N/A	N/A	N/A		
Pre-Verification	AC164CAB	AC164CAB	AC164CAB		
Start File	AC164000	AC164015	AC164022		
Finish File	AC164014	AC164021	AC164028		
Post-Verification	AC164CAA	AC164CAA	AC164CAA		
Depth Return Error (in.)	0	N/A	- 0.5		
Comments	No fine-gain adjustment	No fine-gain adjustment	No fine-gain adjustment		

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	7	8 Repeat		
Date	11/14/06	11/15/06	11/15/06		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	2.0	50.0	15.0		
Finish Depth (ft)	52.0	106.0	30.0		
Count Time (sec)	15	15	15		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	0.25	0.25	0.25		
ft/min	1.0	1.0	1.0		
Pre-Verification	BM019CAB	BM020CAB	BM020CAB		
Start File	BM019000	BM020000	BM020225		
Finish File	BM019200	BM020224	BM020285		
Post-Verification	BM019CAA	BM020CAA	BM020CAA		
Depth Return Error (in.)	- 1	N/A	- 1		
Comments	None	None	None		

Logging Operation Notes:

Logging was performed in this borehole with the SGLS, HRLS, and NMLS. Logging was conducted with a centralizer on each sonde. Measurements are referenced to the top of casing. Repeat sections were collected in this borehole to evaluate the logging systems' performance.

Analysis Notes:

Analyst:	Henwood	Date:	01/08/07	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging systems were performed before and after data acquisition. Acceptance criteria were met for all systems.

A casing correction for 5/16-in.-thick casing (8-in. casing) was applied to the spectral log data (SGLS and HRLS). For moisture corrections, an 8-in. inside diameter casing was assumed.

SGLS and HRLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G1Emay06.xls and G1CNov06.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Dead time corrections are applied where dead times exceed approximately 11 percent. Where SGLS dead time exceeds 40 percent, HRLS data are acquired. The 662 keV energy peaks derived from the SGLS and HRLS data were compared. It was concluded the SGLS data provided the best full energy peaks. Thus, HRLS data are not substituted for SGLS data.

Results and Interpretations:

Cs-137 was detected from 7 to 62 ft and intermittently from 64 to 89 ft. The maximum concentration is approximately 3,800 pCi/g at 45 ft.

Moisture measurements show variability. The data acquired between the ground surface and 20 ft are influenced by grout placed around the casing .

Spectral gamma data were acquired in this borehole in 1992, by Westinghouse Hanford Company using the Radionuclide Logging System (RLS). A comparison plot of RLS spectral data with the current SGLS data is included. After the RLS data are decayed to the date of the current logging event, Cs-137 concentrations are in good agreement. Even though there is some disagreement in concentrations, the activity profiles indicate good agreement and no significant changes since 1992.

The repeat sections for the SGLS and NMLS indicate good agreement for Cs-137, naturally occurring radionuclides, and moisture.

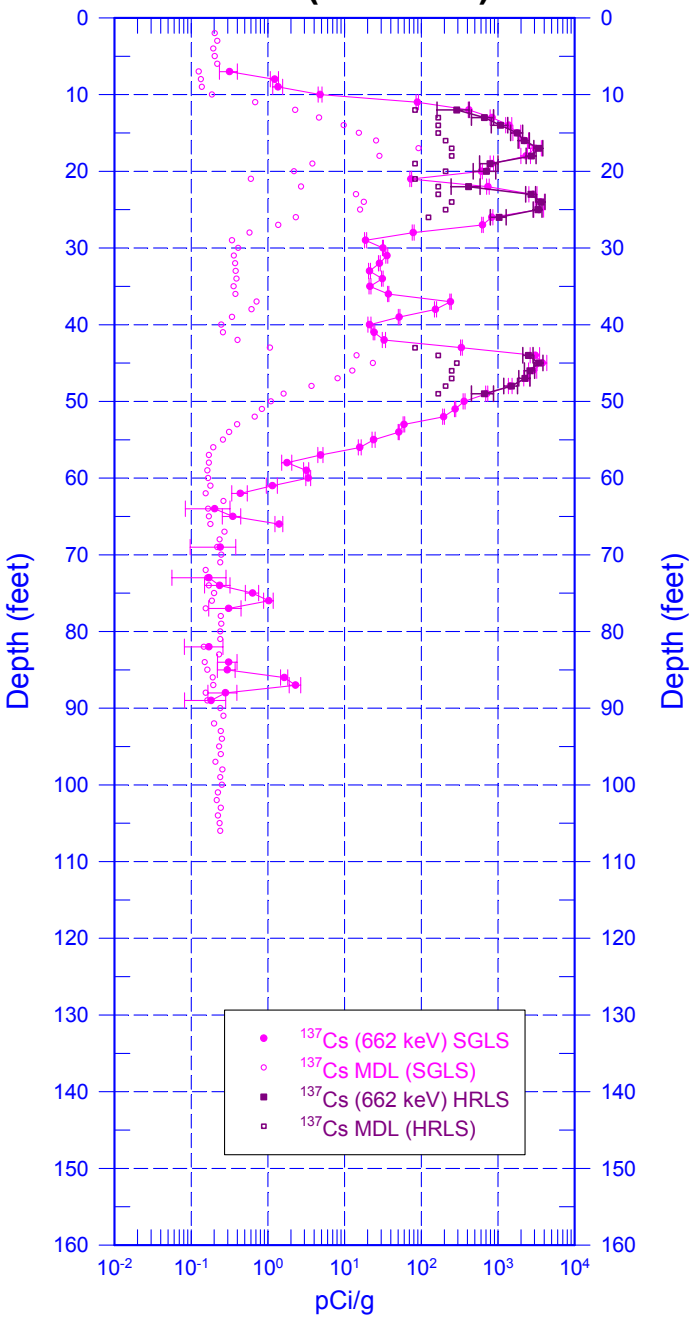
List of Plots:

Cs-137 (662 keV)
Natural Gamma Logs
Combination Plot
Total Gamma & Moisture
Total Gamma & Dead Time
SGLS/RLS Comparison
Cs-137 (662 keV) repeat Section
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[1] GWL – groundwater level

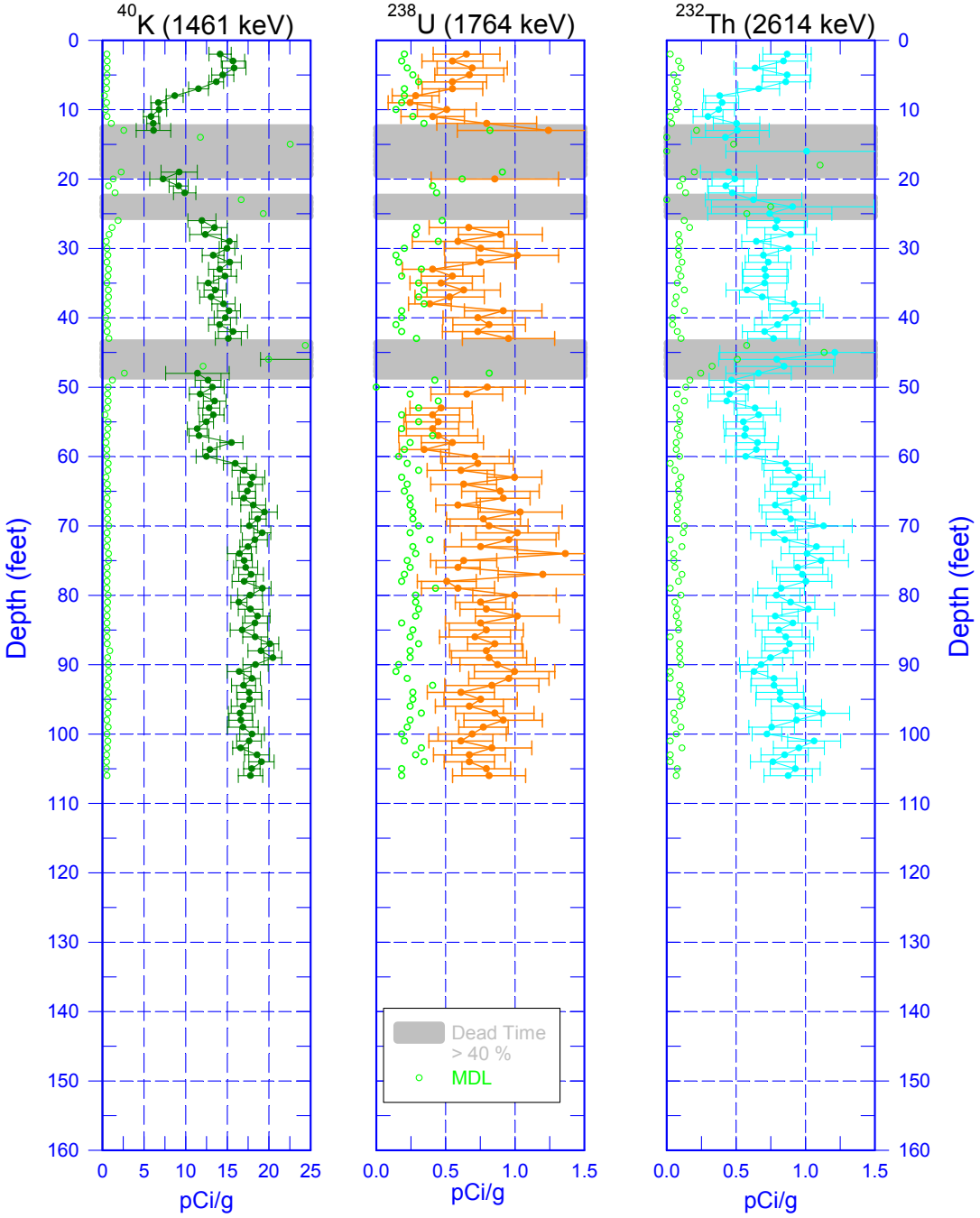
299-W26-51 (A8061)

^{137}Cs (662 keV)



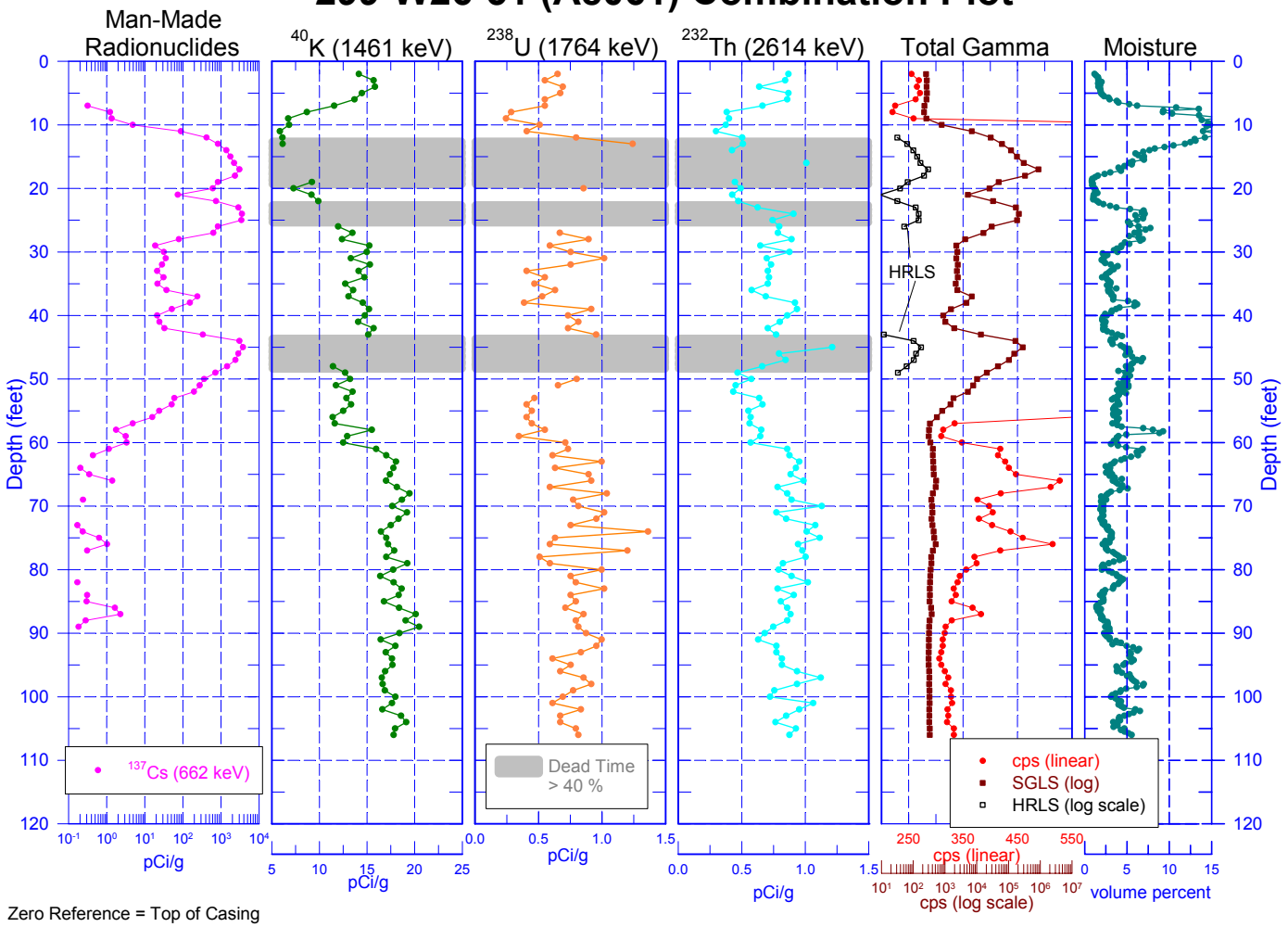
Zero Reference = Top of Casing

299-W26-51 (A8061)
Natural Gamma Logs



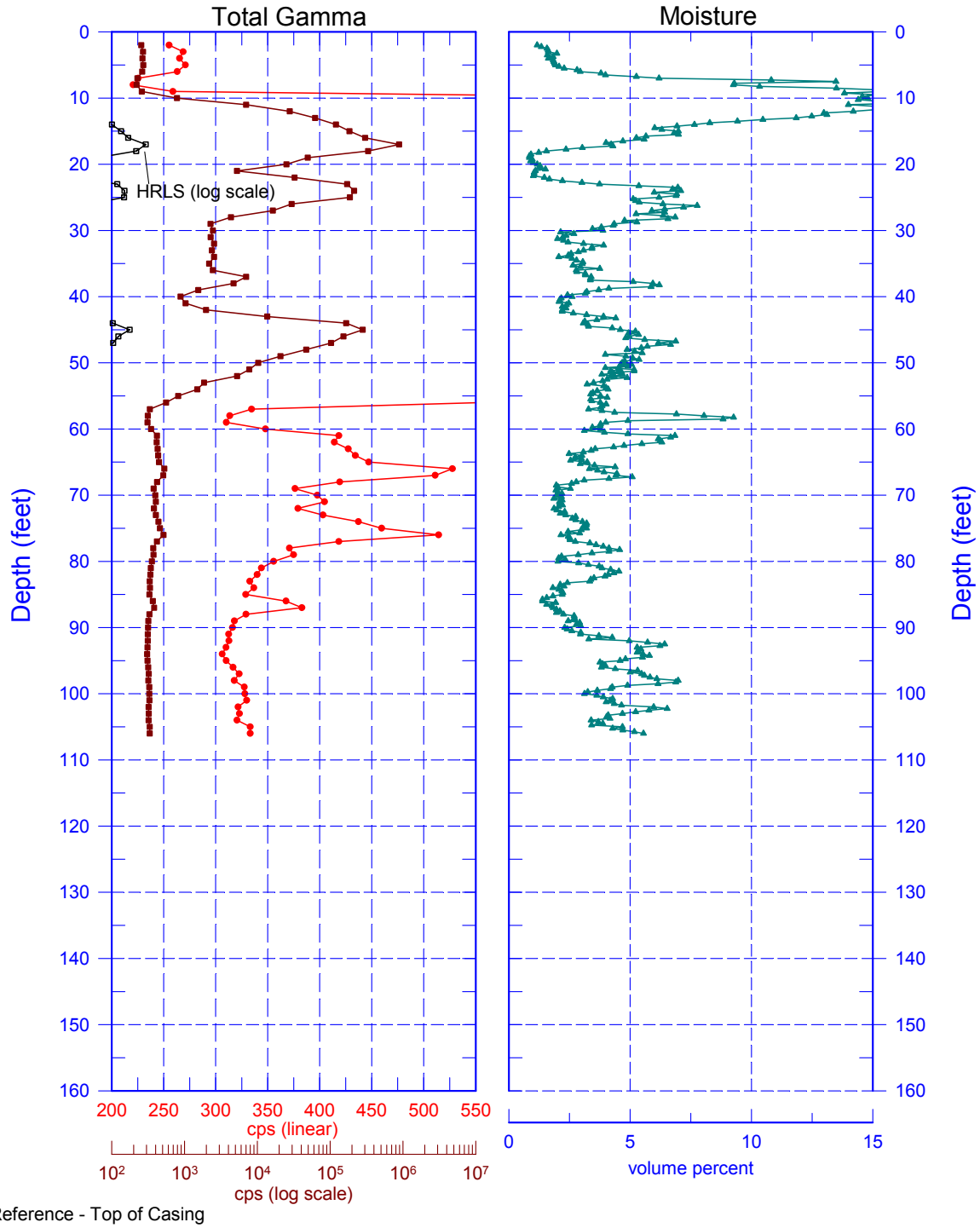
Zero Reference = Top of Casing

299-W26-51 (A8061) Combination Plot



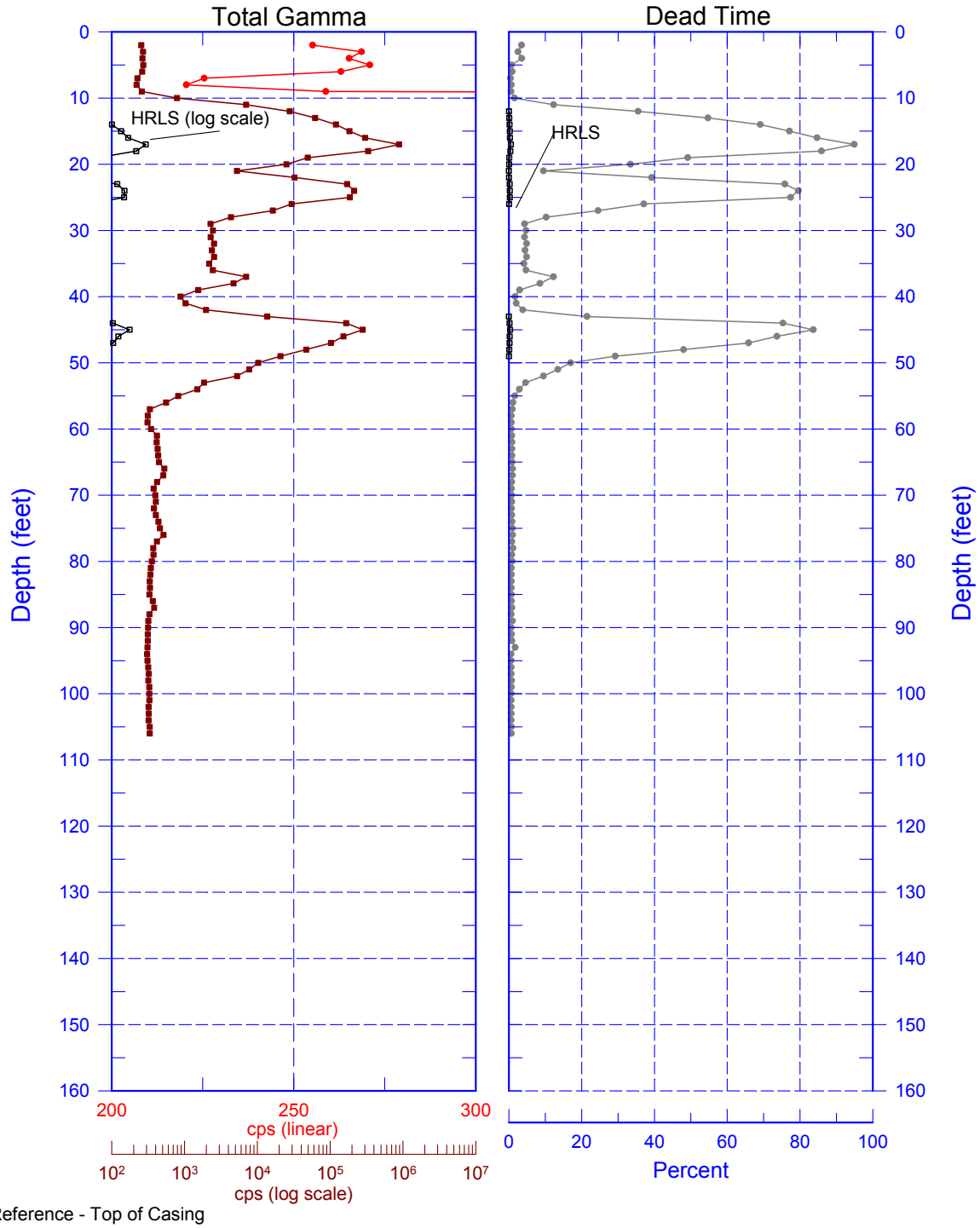
Zero Reference = Top of Casing

299-W26-51 (A8061)
Total Gamma & Moisture



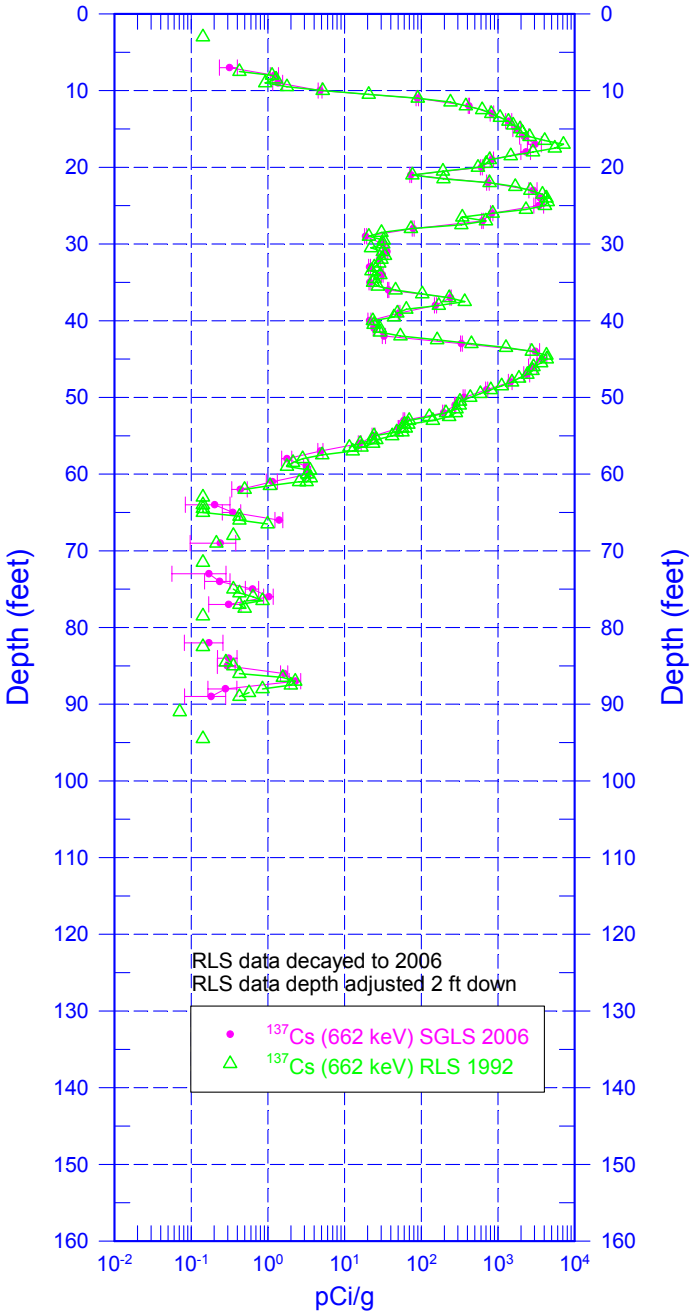
Reference - Top of Casing

299-W26-51 (A8061)
Total Gamma & Dead Time



Reference - Top of Casing

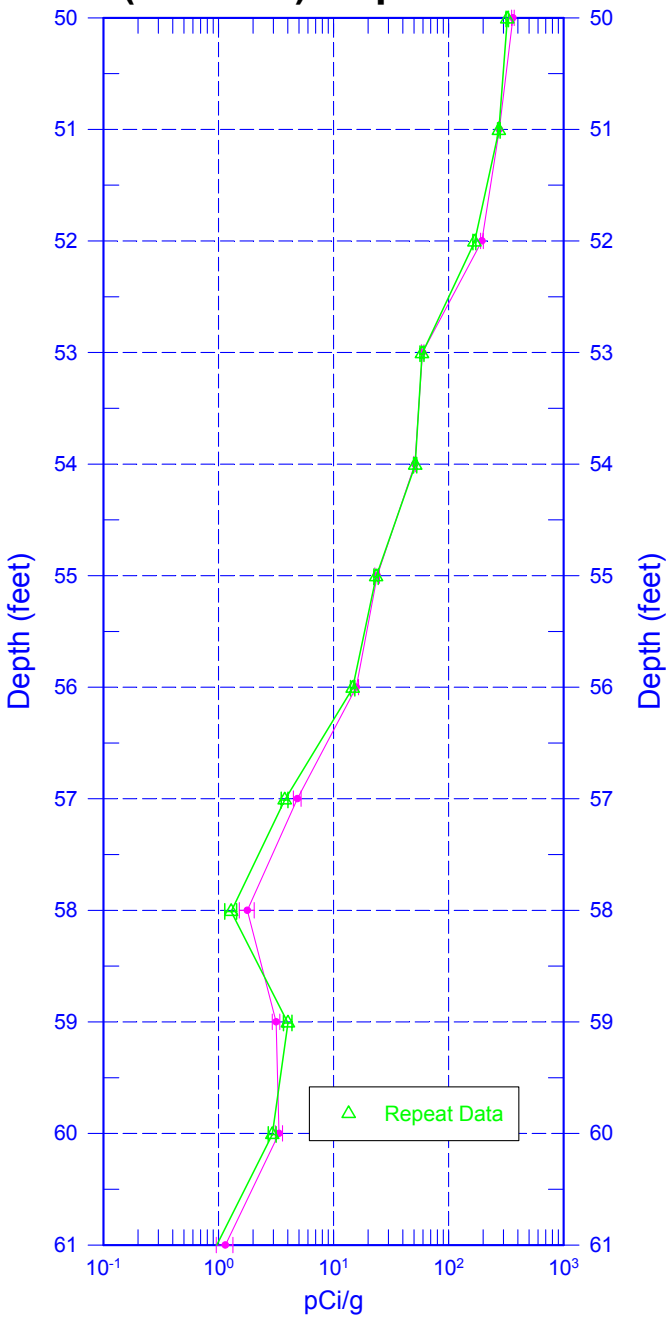
299-W26-51 (A8061)
SGLS/RLS Comparison



Zero Reference = Top of Casing

299-W26-51 (A8061)

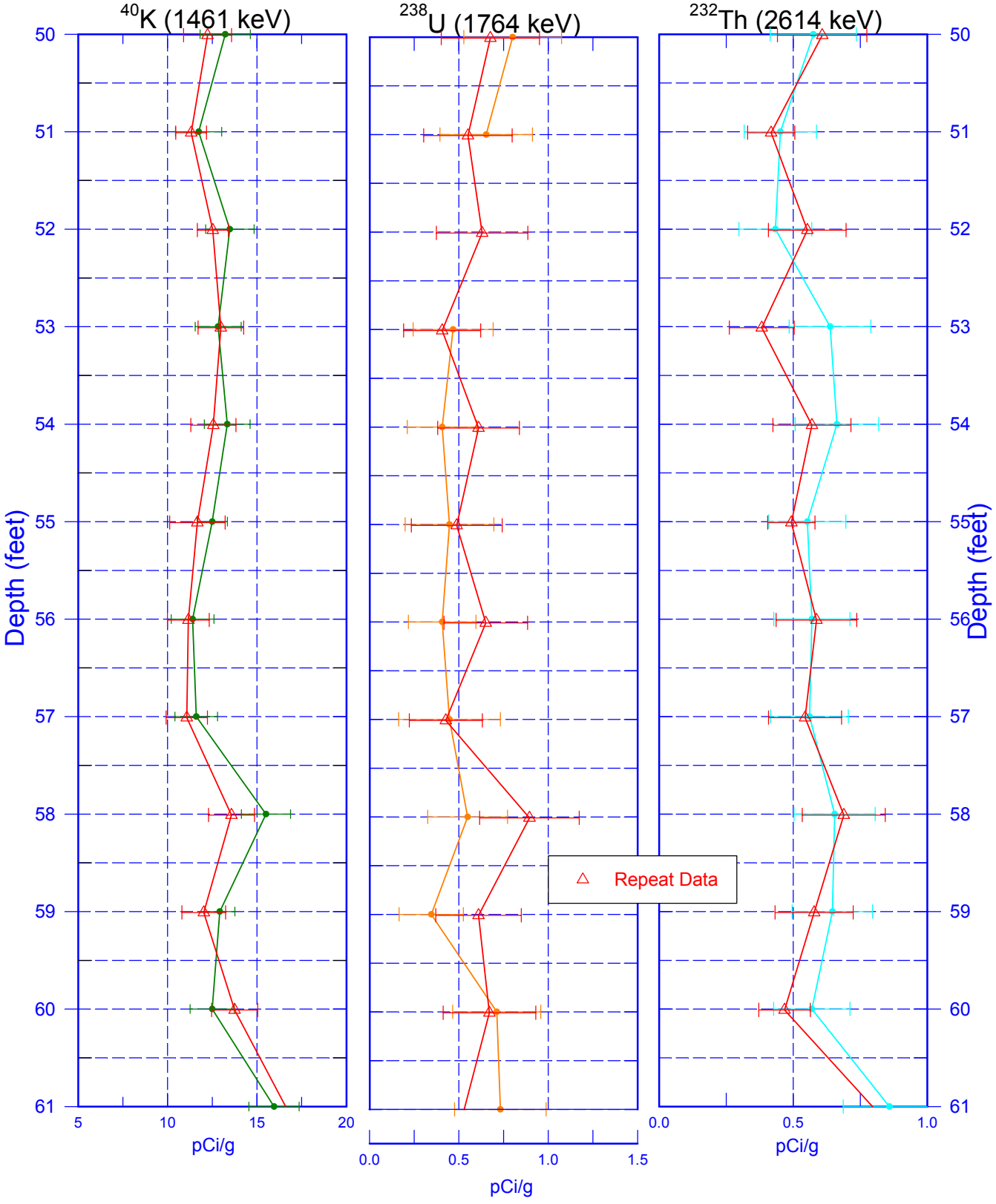
^{137}Cs (662 keV) Repeat Section



Zero Reference = Top of Casing

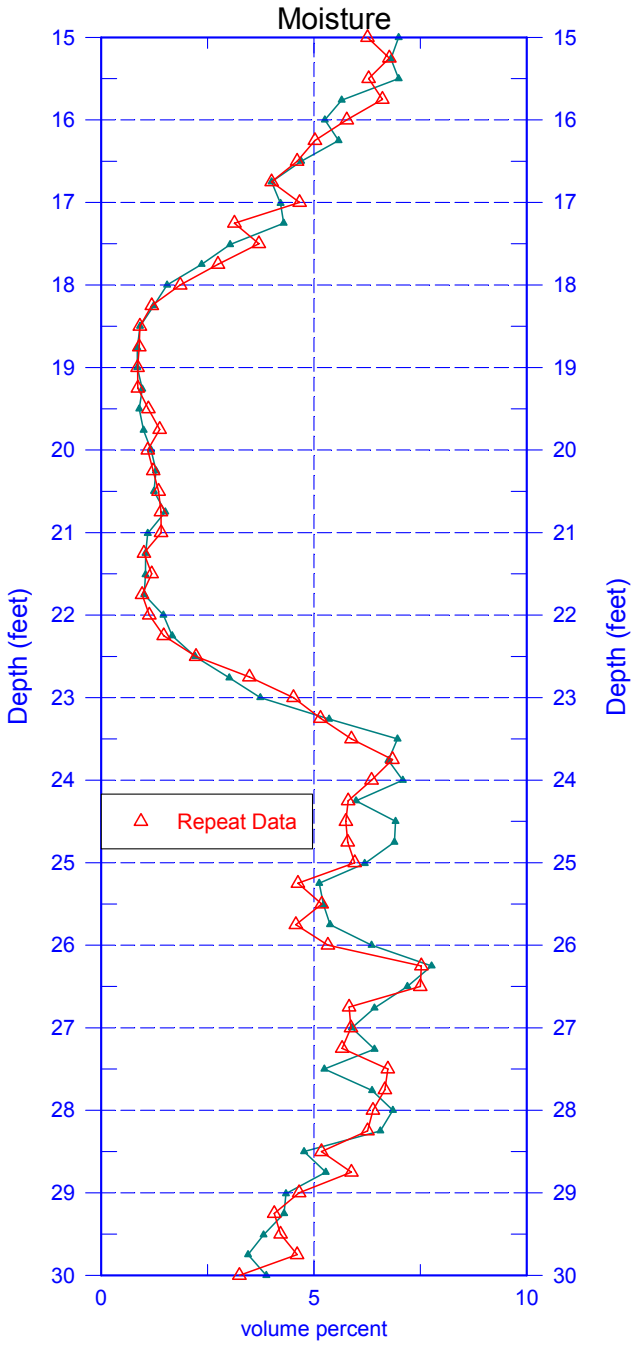
299-W26-51 (A8061)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing

299-W26-51 (A8061)
Moisture Repeat Section



Reference - Top of Casing